REMARKS/ARGUMENTS

Claims 21-40 are pending in this Application.

Claims 21, 32, 34, and 39 are currently amended.

Claims 21-40 remain pending in the Application after entry of this Amendment. No new matter has been entered.

In the Office Action, Applicant's Information Disclosure Statement filed December 5, 2005 stands objected to due to the lack of drawings associated with a reference. The available copy of the reference does not include figures as submitted in the IDS. Applicant's undersigned will attempt to obtain a copy of the reference with figures as requested in the Office Action, and submit the reference in a Supplemental Information Disclosure Statement.

Claims 21-40 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,590,261 to Sclaroff et al. (hereinafter "Sclaroff").

Claim Rejections Under 35 U.S.C. § 102(b)

Applicant respectfully traverses the rejections and requests reconsideration and withdrawal of the rejections based on Sclaroff. In the Office Action, claims 21-40 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Sclaroff. The Office Action alleges that Sclaroff teaches or suggests all of the claimed limitations of the corresponding claims. To anticipate a pending claim, a prior art reference must provide, either expressly or inherently, each and every limitation of the pending claim. (M.P.E.P. § 2131). Applicant respectfully submits that Sclaroff fails to disclose at least one of the claimed limitations recited in each of the corresponding claims.

Claim 21

Claim 21 recites a computer-implemented method for generating a graphical warp through transformation of an undeformed model to a deformed model. The method recited in claim 21 includes separate steps of receiving information specifying an undeformed model and receiving a set of feature specifications, each feature specification comprising a source feature

and a target feature. Claim 21 recites receiving a set of transformations independent of the set of feature specifications, for mapping the source feature to the target feature in each feature specification. Claim 21 also recites receiving a set of strength fields for scaling the magnitude of transformations in the set of transformations to generate a set of scaled transformations. Further, claim 21 recites receiving a set of weighting fields defined over the undeformed model independent of the set of strength fields, for determining the relative influence of the set of scaled transformations. As recite in claim 21, the deformed model is then generated using a graphical warp through transformation of the undeformed model to the deformed model by applying the set of transformations, the set of strength fields, and the set of weight fields to the undeformed model.

Applicant submits that Sclaroff does not teach or suggest at least one of the above-recited features of claim 21.

As discussed in previous responses, the method recited in claim 21 provides a generalized flexible solution for generating warps. As recited in claim 21, the set of feature specifications and the set of transformations may be independently received. Further, the set of strength fields and the set of weighting fields are decoupled and may be separately and independently received. The Office Action expresses concern that the limitations that "the set of transformations may be independently received" and that "the set of strength fields and the set of weighting fields are decoupled and may be separately received" where not found in claim 21. In response to such concerns, Applicant has now amended claim 21 to expressly recited the features of "receiving, independent of the set of feature specifications, a set of transformations for mapping the source feature to the target feature in each feature specification in the set of feature specifications" and "receiving, independent of the set of strength fields, a set of weighting fields defined over the undeformed model for determining the relative influence of the set of scaled transformations."

By allowing the set of feature specifications, the set of transformations, the set of strength fields, and the set of weighting fields to be received in the manner recited in claim 21, an infinite number of deformations may be used on any undeformed model. This provides a warp designer the flexibility to modulate and blend transformations of a model. This also

provides a generalized and flexible method for performing any number of deformations. Applicant submits that these features are not taught or suggested by Sclaroff.

Applicant respectfully disagrees with the Office Action assertion that in the previous response, Applicant recited the scope of claim 21 which the Office Action alleges is the scope of Scarloff. Sclaroff is directed to a morphing system for creating intermediate images that, viewed serially, make an object in a source image appear to metamorphose into a different object in a target image. (Sclaroff: Abstract, lines 1-3). Generating the intermediate images in Sclaroff is the easy part, the difficult part is the feature-correspondence problem encountered in object recognition, alignment, and morphing (Sclaroff: Col. 1, lines 7-9). However, the method recited in claim 21 provides a generalized flexible solution for generating warps – which is substantially different from the alignment processing and creating of intermediate images in Sclaroff that make an object in a source image appear to metamorphose into a different object in a target image.

The Office Action also states that the recitation "warping" has not been given patentable weight because the recitation occurs in the preamble. The Office Action further alleges that though claim 21 may be steps of how to warp an undeformed model, the steps of claim 21 may be broad enough to give steps on how to transform models given a source data with source features and target data with target features. The Office Action alleges that transformations can warp models in size, shape, color, form, etc. Applicant respectfully disagrees with the interpretation provided in the Office Action. Additionally, Applicant has amended claim 21 to recite "generating the deformed model using a graphical warp through transformation of the undeformed model to the deformed model by applying the set of transformations, the set of strength fields, and the set of weight fields to the undeformed model." While by allowing the set of feature specifications, the set of transformations, the set of strength fields, and the set of weighting fields to be received in the manner recited in claim 21, an infinite number of deformations may be used on any undeformed model using a graphical warp.

Applicant submits that the Office Action has not pointed to where the generalized and flexible method for performing any number of deformations as recited in claim 21 is

disclosed by Sclaroff or by the transformations that can warp models in size, shape, color, form, etc.

As described in the Background section of Sclaroff, given a source image and a target image, correspondences must be assigned between feature points in the source image and those in the target image. However, to do this without human intervention is a problem. (Sclaroff: Col. 1, lines 36-45). The invention described in Sclaroff describes a correspondence-assignment technique that considerably reduces the degree to which humans must intervene in morphing, alignment, and object recognition. (Sclaroff: Col. 2, lines 6-8).

In Sclaroff, modal displacements are first used to find correspondences between features points in the source and target images (Sclaroff: Col. 2, lines 26-28). Associations between features in the source image and features in the target image are then determined based upon equations as determined by how close they are in the generalized feature space (Sclaroff: Col. 10, lines 12-15). Correspondence between the nodes in the source image and target image is determined by determining how close the generalized feature vector determined for a feature (i.e., nodal) point in one image is to that determined for a feature point in the other image (Sclaroff: Col. 10, lines 45-48).

Applicant would further like to point out that the equations of motion and the processing depicted in FIG. 1 of Sclaroff is substantially different from claim 21. Claim 21 recites a method for warping an undeformed model to produce a deformed model using a set of transformations, set of strength fields, and set of weighting fields. FIG. 1 of Sclaroff and the associated description comprising Cols. 4-18 of Sclaroff have nothing to do with warping as recited in claim 21 -- instead, the processing described in the above-identified sections of Sclaroff is used to determine correspondences between a source image and a target image. Sclaroff clearly points to this in Col. 18, lines 65-66, where Sclaroff discloses that the result, of the equations, is a <u>non-deformational transformation</u> that yields a rough <u>alignment</u> of the source and target images as shown in FIGS. 2 and 3. Accordingly, Sclaroff merely describes a mechanism, with associated transformations, for associating source features with target features to provide a rough alignment. FIG. 3 shows the result of the translation, rotation, and scaling determined in Sclaroff. (Sclaroff: Col. 19, line 1). This is not the focus of the invention recited

in claim 21. The invention in claim 21 is concerned with the larger question of how to warp the undeformed model to the deformed model in light of corresponding source and target features.

Sclaroff further discusses the actual morphing operations, which involve the generation of intermediate images that, shown in succession, make an object in the source image appear to metamorphose into an object in the target image. In Sclaroff, this is accomplished by image-to-image interpolation. (Sclaroff: Col. 20, lines 4-13). Examples are shown in Fig. 6 and Fig. 7 of Sclaroff and described in Cols. 20 and 21. These examples use flow fields to generate the intermediate images. These examples also use animation functions to determine intermediate frames. However, claim 21 clearly recites "receiving information specifying the undeformed model" and "generating the deformed model by applying the set of transformations, the set of strength fields, and the set of weighting fields to the undeformed model." Again, Applicant submits that the processing performed for the examples depicted in FIGS. 6 and 7 of Sclaroff is substantially different from the warping method recited in claim 21.

In light of the above, Applicant submits that claim 21 is patentable over Sclaroff for at least the reasons stated above.

Claims 22-29

Applicant submits that claims 22-29 that depend from claim 21 should be allowed for at least a similar rationale as discussed for allowing claim 21, and others. The dependent claims also recite additional features that make the claims patentable for additional reasons.

Claims 30-40

Applicant submits that independent claims 30, 32, 34, 37, 39, and 40 should be allowable for at least a similar rationale as discussed for allowing claim 21, and others.

Applicant submits that dependent claims 31, 33, 35-36, and 38 that depend from independent claims 30, 32, 34, and 37 respectively, should be allowed for at least a similar rationale as discussed for allowing the independent claims, and others. The dependent claims also recite additional features that make the claims patentable for additional reasons.

CONCLUSION

In view of the foregoing, Applicant believes all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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Attachments
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